

Godfrey Nolan



Bulletproof Android™

Practical Advice for Building Secure Apps



Bulletproof Android™

Bulletproof Android: Practical Advice for Building Secure Apps

Table of Contents

Contents

Preface

Acknowledgments

About the Author

1 Android Security Issues

Why Android?

Decompiling an APK

Art for Arts Sake

Guidelines

PCI Mobile Payment Acceptance Security Guidelines

Google Security

HIPAA Secure

OWASP Top 10 Mobile Risks (2014)

Forrester Research's Top 10 Nontechnical Security Issues in Mobile
App Development

Securing the Device

SEAndroid

Federal Information Processing Standard (FIPS)

Conclusion

2 Protecting Your Code

Looking into the classes.dex File

Table of Contents

Obfuscation Best Practices

- No Obfuscation

- ProGuard

- DexGuard

- Security Through Obscurity

- Testing

Smali

- Helloworld

- Remove App Store Check

Hiding Business Rules in the NDK

Conclusion

3 Authentication

Secure Logins

Understanding Best Practices for User Authentication and Account Validation

- Take 1

- Take 2

- Take 3

- Take 4

Application Licensing with LVL

OAuth

- OAuth with Facebook

- Web and Mobile Session Management

- Vulnerability

User Behavior

- Two (or More) Factor Authentication

Conclusion

Table of Contents

4 Network Communication

HTTP(S) Connection

Symmetric Keys

Asymmetric Keys

Ineffective SSL

Man-in-the-Middle Demo

Root Your Phone

Charles Proxy Test

Conclusion

5 Android Databases

Android Database Security Issues

SQLite

Backing Up the Database Using adb

Disabling Backup

SQLCipher

Finding the Key

Hiding the Key

Ask Each Time

Shared Preferences

In the Code

In the NDK

Web Services

SQL Injection

Conclusion

6 Web Server Attacks

Web Services

OWASP Web Services Cheat Sheet

Table of Contents

Replay Attacks

Cross Platform

WebView Attacks

SQL Injection

XSS

Cloud

OWASP Web Top 10 Risks

OWASP Cloud Top 10 Risks

HIPAA Web Server Compliance

Conclusion

7 Third-Party Library Integration

Transferring the Risk

Permissions

Installing Third-Party Apps

Installing Crittercism

Installing Crashlytics

Trust but Verify

Decompiling SDKs

Man in the Middle

Conclusion

8 Device Security

Wiping Your Device

Fragmentation

adb Backup

Logs

Device Encryption

SEAndroid

Table of Contents

FIPS 140-2

Mobile Device Management

Conclusion

9 The Future

More Sophisticated Attacks

Internet of Things

Android Wearables

Ford Sync AppID

Audits and Compliance

Tools

Drozer

OWASP Mobile Top 10 Risks

Lint

Conclusion

Index